

**MWI 3410.1**

**REVISION F**

**EFFECTIVE DATE: November 2, 2005**

**EXPIRATION DATE: November 2, 2010**

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# **MARSHALL WORK INSTRUCTION**

**QD01**

## **PERSONNEL CERTIFICATION PROGRAM**

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 2 of 28

## DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P18.1-C01 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files.
Revision	A	8/16/99	Changed scope to limit personnel certification to work on flight or flight-associated hardware. Added requirement for disposition of records after retention period. Updated for changes due to reorganization. Clarified in paragraphs 1 and 2 that hazardous operations that do not already require certification must be evaluated by S&MA to determine if personnel certification is required.
Revision	B	11/15/99	Complete rewrite to combine safety and skills certification requirements into one instruction.
Revision	C	9/15/00	Modified paragraph 1 to clarify that the document only applies to certifications issued by MSFC. Added documents referenced in Table 1 to applicable documents list. Updated Table 1 to correct requirement errors. Added definitions for Type A and B on-the-job training (OJT). Modified Table 1 to include the appropriate type of OJT. Deleted PCH lifting operations from Table 1 since these are covered by the lifting equipment certification. Changed certification periods of numerous certifications to match OSHA requirement of three years. Added "Propellant and Explosive Inspection" to Table 1. Deleted Note 3 from Table 1. Added paragraph 6.1.2 to require notification of certification expiration 6 months in advance per MPG 3410.1 (NCRs 311 and 312). Added paragraph 6.1.4 to include certified personnel responsibilities. Included the applicable contents of MWI 3410.2 and 3410.3 in Appendices A and B. Added definitions, applicable documents, and applicable quality records from these MWIs. Modified paragraphs 6.3.2 and 6.4 to remove unnecessary requirements. CERTRAK made accessible to employees eliminating the need for certification cards. Deleted Figures 1 and 2 and included necessary requirements in paragraph 6. Added Level III experience requirements to Appendix A and modified requirement for ASNT Level III as a prerequisite for MSFC Level III. Deleted requirement from B2.1 for examiner to document training organization approval process in an organizational issuance.
Revision	D	7/02/01	Changed "Applicability" paragraph to allow issuance of MSFC skills certifications to S&MA mission services contractor personnel. Added the instructions for accessing CERTRAK in the definition of CERTRAK. Modified paragraph 5.11.1 to clarify documentation for OJT Type A. Deleted last sentence in this paragraph. Modified paragraph 5.11.1 to delete reference to MSFC Form 4083-3 and substitute MSFC Form 4333. Modified paragraph 5.11.1 by deleting colon and adding commas. Added CERTRAK to paragraph 6.1.2 and deleted "through the CA," to clarify the means by which personnel and supervisors are notified when certifications are expiring. Moved paragraph 6.5 to paragraph 7. Item number 9.3, added the MSFC Form numbers 4083 and 4083-1. Deleted 9.6 and renumbered paragraphs. To the Lockout/Tagout specialty we added procedure review records. Deleted second reference to cancelled directive MWI 3410.2A dated August 3, 1999. Section 12, add MWI 3410.1C dated September 15, 2000. Modified certification specialties for: Flagman changes requirements; Changed Laser Operator to > Class 3B; Modified Lifting Equipment Examiner (Proficiency Test Examiner); Modified PCH S&MA Monitor to delete organization code. Added asterisks to certification specialties Propellant & Explosive Inspection and Propellant & Explosive User, also modified the certification period for these categories to 1 year; added new safety certifications for

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 3 of 28

			Inert/Asphyxiate Gases and Liquids, Hydrogen Handlers, Oxygen Handlers, and Oxygen Users. Modified note (1) to add date of training must be listed on MSFC Form 4083. Modified note number (3) to state that Lockout/Tagout procedures must be reviewed according to 29 CFR 1910.147. Updated NASA-STD references in the titles of MSFC-STDs listed in the applicable documents. Changed Thermography Testing to Thermal/Infrared Testing and clarified requirement. Clarified the certification requirements for NDE Level III in the definitions and in Appendix A. Combined certification requirements for plated-through hole and surface mount technology soldering in Table B-1.
Revision	E	11/8/2004	<p>Revised per HQ Rules Review.</p> <p>Pg. 4, Para. 2. APPLICABILITY, replace will typically be certified with shall be certified. Replace However, all contractors with Additionally, all contractors. Pg. 6, 5.3 CERTRAK, data base is revised to read one word database Pg. 6, Para. 5.3 CERTRAK, add Civil Service and Contractor...employee certification records.</p> <p>Pg. 6, Para. 5.4, Contractor Certifying Officer, replace issue safety certifications with approve...Pg. 6, Para. 5.5 Employee and Organizational Development Department (EODD) add provides personnel certification education and training to civil service and contractor personnel. Pg. 7, Para. 5.11, OJT Training, delete certified operator who supervised operator for 3 months, and add supervisor..., delete signature of, .should read signature of supervisor and applicant. Pg. 8, change to read not to exceed 12 months. Pg. 9, Para. add 6.1.3.1, Ensure that training assessments are completed for all personnel certification specialties. Renumber paras. 6.1.3.2-6.1.3.4, Pg. Pg. 12, change to read or in a location nearby the operation for which the certification is necessary. Pg. 10, Para. 6.2.1, Safety Certification, delete and certification programs. Also delete obtain formal training, OJT, physical examinations, and written and proficiency examinations as required by Table 1. and add comply with Table 1 certification requirements. Pg. 10, Para. 6.3 Contractor Requirements, delete the, training, to read determine the safety and certification training required. Also delete the to read...define other specialties/operations. Pg. 10, Para. 6.3, Contractor Requirements, delete Contractor programs must satisfy the intent and requirements of this Instruction. Pg. 10, Para. 6.3.2, change to .affected employees have training assessments and certifications. Delete receive safety training and certification. Delete issue company certifications or. Pg. 17, Delete OSHA 501 from PCH-S&amp;MA Monitor certification specialty. Delete high school graduate requirement for Propellants and Explosives Inspection cert specialty. Revise the cert period for Propellant and Explosive Handler, and Inspection to 2 years. Para. 6.1.4 was revised to Certified personnel, safety representatives, and supervisors who have been granted approval by the CA. CERTRAK. Pg. 14, Lull Boom was added to Forklift class 7 and deleted as a separate certification specialty. NSS GO 1740.9 deleted throughout the document to be replaced with current document NASA-STD-8719.9, Standard for Lifting Devices and Equipment. Pg. 11, note 7.3 added. Pg. 13, Aerial Lift specialty, proficiency test added to recert column. Derrick Crane Operator cert specialty requirements revised to add PCH/Critical. Derrick Crane specialty, bullet added stating PCH Training for PCH Cert. Derrick Crane recert column delete, or documentation....Pg. 13 Forklift Operator cert specialty, revise bullet to add PCH/Critical. Add bullet to add PCH Training for PCH Cert. (AD42) (See Note 1) Pg. 13, Gantry crane specialty, revise bullet to read Type A OJT for PCH/Critical, also add bullet stating PCH Training for PCH Cert. (AD42) (See Note 1), in recert-requirement column delete or documentation of participation...Pg. 12, changed to read Pg. 13, Hydraset Operator specialty, revise to read Type A OJT for PCH/Critical, also add bullet stating PCH Training for PCH Cert. (AD42) (See Note 1), Pg. 18, Mobile Crane cert specialty revise statement to read Type A OJT for PCH/Critical, add bullet stating</p>

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VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE**

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 4 of 28

			<p>PCH Training for PCH Cert. (AD42) (See Note 1) Pg. 19 Overhead crane/hoist operator cert specialty, revise requirement bullet to read Type A OJT for PCH/Critical, add a bullet stating PCH Training for PCH Cert. (AD42) (See Note 1). Revise bullet in recert-requirement column to delete or documentation of participation in two noncritical or critical lift operations per year. Pg. 19, Rigger cert specialty, revise first bullet in requirements column to read Accredited Lift Riggers Course, revise 3<sup>rd</sup> bullet in requirements column to read Type A OJT for PCH/Critical, add a bullet stating PCH Training for PCH cert. (AD42) (See Note 1). In recert/requirements column delete the words...or documentation in two noncritical or critical lift operations per year. Add a bullet, Written Test. Page 20, delete paragraph 5 and 6. Page 4, delete 3.4 MPD 1280.1, "Marshall Management Manual" directive has been cancelled. Pg. 15. Forklift operator must be 18 years old to operate. Written tests have been deleted in Table 1 as requirements. Written tests will be issued in training specific to the certification and administered by instructor if deemed necessary. QS01 was changed throughout document to QD01 due to S&amp;MA Office designated as a Directorate instead of an Office. Changes throughout document per HQ rules review, changed format.</p>
Revision	F	11/02/2005	<p>Major rewrite to clarify certification flow and requirements. The rewrite affected all sections and section numbering. In Appendix A, AD02 and AD42, organization codes were changed to AS60 and AS42 respectively. Certification tables were changed to appendices. Table 1 is now listed as Appendix A. Several certification specialties were deleted from Appendix A. Those specialties deleted were Asbestos Abatement for asbestos/heavy metal, Asbestos Exposure Awareness (Class IV), Asbestos Operations and Maintenance Class III, Commercial Motor Vehicle Operator (&gt;25,000 lbs), Fall Protection, Flagman, Flight Deck Crew, Hazardous Material Handlers (HAZWOPER), Hyperbaric Chamber, Laser Operator &gt;3A, Mobile Sweeper Operator, PCH Move Manager, PCH Truck Driver (&gt;25,000 lbs), Powder Actuated Tool Operator, Propellant and Explosive Inspection, Rescue Personnel, Scaffolds Competent Person, Space Station Element Transportation System (SSETS) ECS Technician, SSETS INCS Technician, and Wind Tunnel Operator. Hazardous Waste Operations and Emergency Response Technician was added to Appendix A. Appendix B was added for specialties that require state and federal training but MSFC certification is not required. These specialties are Asbestos Abatement for asbestos/heavy metal, Asbestos Exposure Awareness, Asbestos Operations and Maintenance, Commercial Motor Vehicle Operator, and Flight Deck Crew. Available Safety, Health, and Environmental (SHE) equivalent numbers were added to NSTC course numbers. Updated "PURPOSE" by adding the following sentence: "For personnel training/qualification which does not require certification, reference MPR 3410.1, Training."; Updated the "APPLICABILITY" section by revising the first sentence as follows: deleted "at MSFC engaged in" added "performing", deleted Table 1 added Appendix A, deleted S&amp;MA added Safety and Mission Assurance Directorate (S&amp;MA), deleted "critical", deleted Table 2, added Appendix C, revised sentence to read "for flight and flight-associated hardware." , and deleted " , or other hardware as identified by the process owner"; In second sentence deleted "that MSFC Safety and Mission Assurance (S&amp;MA) reviews and approves."; In third sentence added "to include university and grant personnel" deleted "or" added "and"; Updated the "APPLICABLE DOCUMENTS" section by performing the following: 1) Deleted MSFC-SPEC-445, "Adhesive Bonding, Process, and Inspection Requirements" because there are no certification training courses or certified instructors available for this process., 2) Deleted MSFC-STD-2907, "Workmanship Standard for Printed Wiring Boards" because this document applies to the manufacture of printed wiring board products and not to electrical process skills</p>

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 5 of 28

			<p>(EPS)., 3) Added NAS 410, “National Aerospace Standard (NAS) Certification and Qualification of Nondestructive Test Personnel” because this is the actual standard that applies to the training requirements for MSFC Level I and Level II personnel., added NPR 1441.1 “NASA Record Retention Schedule (NPRS)” and 4) Renumbered the paragraphs in the “APPLICABLE DOCUMENTS” section; Updated the “DEFINITIONS” section by performing the following: 1)Revised paragraphs 5.1, 5.3, 5.4, 5.5, 5.6 5.7, 5.9, 5.10, 5.11, 5.11.1, 5.11.2, 5.12, 5.13, 5.14, 5.15, 5.16, 5.21, 5.22, 5.23., 2) Added the definition for “Technical Advisor”, and 3) Renumbered the paragraphs in the “DEFINITIONS” section; Updated the “INSTRUCTIONS” section by revising paragraphs 6.1.1, 6.1.2, 6.1.3.1, 6.1.3.2, 6.1.3.3, 6.1.3.4, 6.1.3.5, 6.1.3.6, 6.1.4, 6.2.1, 6.2.2, 6.3, 6.3.1, 6.3.3, 6.3.4, 6.3.5; Deleted all notes in Section 7 and replaced with “None;” Updated the “RECORDS” section by revising paragraphs 9. RECORDS, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8; Revised 12. CANCELLATION to cancel previous MWI 3410.1 version and effective date. Added Lockout/Tagout note for Appendix A. Added Appendix B, added NOTES FOR APPENDIX B; Deleted NOTES FOR APPENDIX A (1), (2), (3), (4); Updated “Appendix C” by deleting the following test methods, document, and processes: “Acoustic Emissions Testing”, “Thermal/Infrared Testing”, “Computed Tomography”, “Adhesive Bonding Application”, “MSFC-STD-445”, and “Wire Wrap”. There are no certification training courses or certified instructors available for the test methods, per the document requirements, or for the two processes listed above; Also, updated the “REQUIREMENTS” column of APPENDIX C; Updated “APPENDIX D” section D.1 titled “PURPOSE” by replacing “NDT” with “Nondestructive Testing/Nondestructive Evaluation (NDT/NDE)”, and by deleting items f, g, and h for “Acoustic Emissions Testing (AE)”, “Thermal/Infrared Testing (TIR)”, and “Computed Thermography (CT)”, respectively; Revised paragraph D1.1 titled “Exceptions” by deleting the last sentence; Revised paragraphs D1.2 and D1.3; Updated section D.2 titled “TRAINING AND EXPERIENCE REQUIREMENTS” by performing the following: 1) Added the following after the first sentence: “All NDT training shall comply with the requirements of NAS 410, NAS Certification and Qualification of Nondestructive Test Personnel, except as noted herein.”, 2) Deleted “1996” from “SNT-TC-1A”, 3) Deleted paragraph A.2.1 titled “Specialist Personnel” in its entirety, 4) Revised paragraphs D.2.2, D.2.4, D.2.5, D.2.6, and D.2.6.1a, and 5) Renumbered all paragraphs in section D.2; Replaced “Table A-1” with “Table D-1” and updated “APPENDIX D-1 by performing the following: 1) Deleted all entries for Examination Methods “AE”, “CT”, “TIR”, 2) Deleted Notes 1-3 of TABLE D-1; Update section D.3 titled “CERTIFICATION” by revising paragraphs D.3.2 and D.3.3; Updated “APPENDIX E” section E.1 titled “PURPOSE” by deleting the following sentence: “These requirements also apply when other program/industry documents are used that require personnel certification.”; Updated paragraph E.1.2.1 by replacing “Table B-1” with “Appendix E-1”; Updated paragraph E.1.2.2 by replacing “examiners” with “technical advisors”; Revised paragraph E.2.1 titled “Training Organization” as follows: “Training shall be obtained from a school approved by a technical advisor and the MSFC Certifying Officer. Other agencies, which may be used for training, shall be subject to review and approval by the technical advisor and MSFC Certifying Officer.”; Updated paragraph E.2.2 titled “Lesson Plans” by replacing “examiner” with “technical advisor”; Revised paragraph E.2.3 titled “Instructor Qualifications” as follows: “Instructors shall be recognized experts in their field. Instructors shall be evaluated to requirements of the EPS documents specified herein, as determined by the MSFC certifying officer and technical advisor.”; Updated paragraph E.2.4.1 by performing the following: 1)Replace “Table B-1” with “Appendix E-1”, 2) Replace “examiner” with “technical advisor”, 3)</p>
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VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE**

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 6 of 28

			<p>Replace “certifying officer” with “MSFC certifying officer”, and 4) Delete the words “except printed wiring board, (PWB) inspection” from the last sentence of the paragraph; Add the following after the last sentence of the paragraph “Also, for surface mount technology (MSFC-STD-2904), operator certification shall require additional training on the exact machine used for production at the supervisor’s discretion.”;</p> <p>Updated paragraph E.2.4.2 titled “Examinations” by replacing “examiner” with “instructor”, and by deleting the last sentence of the paragraph; Updated paragraph E.2.4.2b titled “Written Examination” by deleting the last sentence of the paragraph; and revising as follows: “For initial certification, each candidate shall score at least 80 percent on a written exam typically consisting of at least 25 questions.”; Updated paragraph E.2.4.2c titled “Practical Examination” by deleting the words “and PWB inspection” from the first sentence of the paragraph, and revising the last sentence of the paragraph as follows: “As an option to the practical exam, proficiency demonstration can also be accomplished by a supervisor and MSFC certifying officer audit of actual work performed provided the audit results are documented and included in the employee’s personnel certification file.”; Updated paragraph E.3.1 by revising the first sentence as follows: “Candidate civil service personnel who meet the above criteria shall be certified by the MSFC certifying officer upon the recommendations of their supervisors. Contractor personnel shall....”;</p> <p>Updated “TABLE E-1” by deleting all entries for “Wire wrap” and “PWB Inspection”, and by deleting Note 1 and Note 5 and all superscripts. Also, updated the “RECERT” column of TABLE E-1 by adding “See E3.2.b” for ESD control; Revised paragraph E.3.2 titled “Recertification” as follows: “Training for recertification shall be required at the discretion of individual’s supervisor. Recertification shall include a demonstration of proficiency in accordance with E.3.2.1.”, a. “Recertification of electrical process skills (EPS) operators and inspectors shall be required every 3 years except for ESD.”, b. “ESD recertification shall be required at the discretion of the individual’s supervisor based on personnel performance, the use of new technology, or when requirement violations are observed.”, c. “When necessary, the MSFC certifying officer shall extend or limit the certification period based on recommendations of the individual’s supervisor. Extensions may not exceed 6 months.”, d. “EPS proficiency examiners/instructors shall be recertified every 2 years except for ESD.”; Revised paragraph E.3.2.1 as follows: “Demonstration of proficiency shall be required for recertification. This may be achieved by fabrication/inspection of samples, completion of a refresher training course approved by the technical advisor, or by auditing an individual’s actual work performed by the MSFC certifying officer and their supervisor. Recertification may also include a written examination.”</p> <p>Updated paragraph E.3.2.2 by revising the last sentence as follows: “The method chosen for recertification shall be the responsibility of the individual’s supervisor.” Deleted paragraph B.3.2.3 in its entirety; Updated paragraph E.3.3.5 by revising as follows: “Job function has changed and new function does not require EPS.”</p>
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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 7 of 28

## 1. PURPOSE

This Marshall Work Instruction (MWI) establishes the requirements for the Marshall Space Flight Center (MSFC) Personnel Certification Program. It contains requirements for safety and skills certifications issued by MSFC. For personnel training/qualification which does not require certifications, reference Marshall Procedural Requirements (MPR) 3410.1, "Training."

## 2. APPLICABILITY

This MWI applies to all MSFC civil service and contractor personnel performing potentially hazardous operations identified in Appendix A, and to MSFC civil service personnel and Safety and Mission Assurance Directorate (S&MA) mission services contractor personnel who perform skills identified in Appendix C for flight and flight-associated hardware. Onsite contractor personnel shall be certified in accordance with contract requirements (defined in the contractor's Safety and Health Plan or Personnel Certification Plan). Additionally, all contractor employees, to include university fellows and grant personnel, who perform program-critical hardware (PCH) handling operations at MSFC, operate lifting equipment owned by MSFC (e.g., cranes, forklifts, and aerial lifts), or handle propellants or explosives onsite, shall be certified by the MSFC S&MA Directorate. Processes or operations that involve hazardous equipment or operations and are not identified herein for certification shall be brought to the attention of S&MA by the supervisor for certification evaluation.

## 3. APPLICABLE DOCUMENTS

3.1 29 CFR 1910, "Occupational Safety and Health Standards"

3.2 29 CFR 1926, "Safety and Health Regulations for Construction"

3.3 NPR 1441.1, "NASA Record Retention Schedules" (NRRS)

3.4 MPD 1840.3, "MSFC Respiratory Protection Program"

3.5 MPD 1860.1, "Laser Safety"

3.6 MPD 1860.2, "Radiation Safety Program"

3.7 MPR 1840.1, "MSFC Confined Space Entries"

3.8 MPR 3410.1, "Training"

3.9 NASA-STD-8719.9, "Standard for Lifting Devices and Equipment"

3.10 MSFC-RQMT-2918, "Requirements for Electrostatic Discharge Control"

3.11 MSFC-STD-2903, "MSFC Tailoring Guide for NASA-STD-8739.3, Soldered Electrical Connections"

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 8 of 28

3.12 MSFC-STD-2904, “MSFC Tailoring Guide for NASA-STD-8739.2, Workmanship Standard for Surface Mount Technology”

3.13 MSFC-STD-2905, “MSFC Tailoring Guide for NASA-STD-8739.4, Crimping, Interconnecting Cables, Harness, and Wiring”

3.14 MSFC-STD-2906, “MSFC Tailoring Guide for NASA-STD-8739.1, Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies”

3.15 ANSI Z136.1, “Safe Use of Lasers”

3.16 NAS 410, “National Aerospace Standard (NAS) Certification and Qualification of Nondestructive Personnel”

3.17 NSS 1740.12, “Safety Standards for Explosives, Propellant, and Pyrotechnics”

3.18 SNT-TC-1A, “Personnel Qualification and Certification in Non-Destructive Testing”

#### 4. REFERENCES

29 CFR Part 1960, “Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters”

#### 5. DEFINITIONS

5.1 Certification (Personnel). The act of verifying and documenting that personnel have completed required training, including On-the-Job Training (OJT), medical requirements, if any, and have demonstrated specified proficiency.

5.2 Certifying Officer. The person designated by the S&MA Directorate to approve personnel for safety certification specialties/skilled operations or the person designated by the contractor to approve contractor personnel for safety certification specialties. A list of civil service and contractor safety certifying officers is maintained by S&MA. The S&MA certifying officer has the authority to approve certification extensions not to exceed 12 months.

5.3 CERTRAK. The S&MA software database used for employee certification records. CERTRAK is used to access personnel certifications electronically and is accessed via the MSFC Safety, Health, and Environmental Web page. Only those employees who have a need are issued a password allowing them to input and change data. All others to include supervisors, managers, and those who have personnel certifications are only allowed to view certifications and the pertinent information such as proficiency examiners and certifying officers.

5.4 Contractor Certifying Officer. The contractor employee who is authorized by the S&MA Directorate to approve safety and skills certifications.

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 9 of 28

5.5 Training and Incentives Office. The MSFC organization that provides personnel certification education and training to civil service and contractor personnel.

5.6 Potentially Hazardous. Any operation, process, facility, or equipment that has a high potential to result in serious injury or death to personnel or damage and/or destruction of property.

5.7 Nondestructive Evaluation (NDE) Level I. An individual certified to set up and calibrate equipment, perform nondestructive testing (NDT), interpret and evaluate acceptance or rejection criteria according to written instructions, and to report on the results. The Level I receives the necessary instruction or supervision from a certified Level II or III individual.

5.8 NDE Level II. An individual certified to set up and calibrate equipment and to interpret and evaluate results with respect to applicable codes, standards, and specifications. The Level II is thoroughly familiar with the scope and limitations of the methods for which certified and exercise assigned responsibility for on-the-job training and guidance of trainees and Level I personnel. The Level II is able to organize and report the results of NDT.

5.9 NDE Level III. NDE Level III personnel are certified using ASNT criteria by an American Society for Nondestructive Testing (ASNT) authorized examination center and have the skills and knowledge to interpret codes, standards, and other contractual documents that control the methods as utilized by MSFC. They select the method and technique for a specific inspection and prepare and verify the adequacy of procedures. Only Level III individuals have the authority to approve procedures for technical adequacy in the method they are certified. Level III individuals prepare detailed training course outlines, conduct training, and examine personnel in the method in which they are certified. Level III individuals do not conduct NDT acceptance of parts unless demonstration of proficiency in the specific technique was included in the practical examination of which the certification is based.

5.10 NDE Trainee. An individual who is participating in a training program for a nondestructive testing (NDT) method and is not certified. Trainees obtain work experience under the guidance of a Level II or Level III in the same method, or under the guidance of a Level I or instructor only when approved by the responsible Level III. Trainees are not permitted to independently conduct tests; make, accept, or reject decisions; or perform any other NDT functions.

5.11 On-the-Job (OJT) Training.

5.11.1 OJT Type A. OJT for certification specialties that require documentation to demonstrate the applicant's qualifications to perform the task. Documentation includes: work history (period of performance, description of equipment or operation), signature of supervisor, and applicant.

5.11.2 OJT Type B. OJT for certification specialties that requires only the signature of the applicant's supervisor on the MSFC Form 4083. The supervisor's signature provides evidence that enough OJT has been completed to consider the applicant for certification.

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 10 of 28

5.12 Proficiency Examiner. The qualified person(s) designated by the S&MA Directorate to develop and administer exams necessary to achieve the desired proficiency in a safety specialty or skill.

5.13 Provisional Certification (applies to safety specialties only). Provisional certifications are issued to candidates who meet all qualifications except OJT. Provisional certifications are issued for up to 1 year. During this year, applicants exercise the tasks requiring safety certification, but only under the direct supervision of a certified operator, thereby receiving the necessary OJT (similar to driving a car under the supervision of a licensed driver). Upon completion of OJT, candidates apply for certification by submitting a MSFC Form 4333, "Training Requirements Plan," or equivalent documentation to the S&MA Certification Administrator (CA).

5.14 Recertification. The process of reconfirming the certification of an individual by training and/or proficiency test at the end of a predetermined period or when lack of proficiency dictates.

5.15 Safety Certification Specialties. Specialties requiring safety certification, as well as, an official record of safety training. Safety certifications are issued to employees who have completed the required training and demonstrated the necessary knowledge and/or proficiency to ensure their ability to complete potentially hazardous operations in a safe manner.

5.16 Safety Training Specialties. Specialties for which authority documents (OSHA, NFPA, NASA, etc.) require an official record of safety training but do not require safety certification.

5.17 S&MA Certification Administrator (CA). The S&MA person designated the administrative functions of safety and skill training/certification.

5.18 Skilled Operations. A necessary activity which is critical to the required quality level of a produced article or material.

5.19 Supervisor. The organizational line manager who provides supervisory functions and responsibilities for employee positions requiring training and/or certification.

5.20 Technical Advisor. The person(s) recommended by their supervisor, for approval by the certifying officer, to evaluate electrical process skills (EPS) requirements for certification. Technical advisors also review consultant training courses to ensure technical adequacy. Technical advisors complete the same training requirements as EPS operators and inspectors, or have equivalent experience. Technical advisors do not need to be certified; however, they are recognized as experts in their field.

5.21 Temporary Certification. Temporary certifications are issued to candidates who meet all the qualifications except formal training and are performing an operation proficiently. Candidates are allowed up to 1 year to complete the required training.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 11 of 28

5.22 Training Coordinator. The person(s) in the Training and Incentives Office designated to provide the administrative functions of training, scheduling, procurement, and documentation.

5.23 Training Database. The database managed by the Training and Incentives Office where records of employee (civil servant and contractor) training are retained.

5.4 Occupational Medicine and Environmental Health Services (OMEHS). The Office that maintains the MSFC Form 4083-2, "Annual Personnel Certification Physical Exam Results."

## 6. INSTRUCTIONS

### 6.1 Certification Program Responsibilities.

6.1.1 The MSFC S&MA Directorate shall implement the personnel certification program and shall maintain CERTRAK.

6.1.2 The Certifying Officer shall review and approve certification packages, courses, and through CERTRAK, shall notify personnel and/or their supervisors at least 6 months prior to an existing certification expiration date and every month thereafter until the certification has been renewed or moved to the inactive file. Training dates, proficiency test dates, and the proficiency examiner for CERTRAK data entry purposes shall be recorded as the date the MSFC Form 4083-1 was signed by the MSFC S&MA Certifying Officer.

6.1.3 Supervisors shall:

6.1.3.1 Ensure that training assessments are completed for all personnel safety certification specialties and skilled operations.

6.1.3.2 Ensure that employees receive appropriate training, experience, and certification for the job performed. Supervisors shall also:

a. Review operator's documentation yearly and ensure proficiency of equipment by monitoring operators during lifts.

b. Ensure that examination elements are up-to-date with current methods and techniques; and lessons-learned shall be adequately addressed.

6.1.3.3 As applicable, assign qualified personnel as proficiency examiners and obtain approval of these personnel from the certifying officer (for MSFC safety certifications, the proficiency examiner shall be listed in CERTRAK before the safety certification can be approved).

6.1.3.4 Identify potentially hazardous operations and skills to S&MA for evaluation to determine if personnel certification is necessary, then assist in the evaluation and determination of certification requirements.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 12 of 28

6.1.3.5 Concur (via signature) on MSFC forms to certify that employees have the required experience for certification.

a. Supervisors shall review MSFC Forms 4083, 4083-1, and 4083-2 as applicable for safety certifications and submit to the Industrial Safety Department for final approval. MSFC Form 4333 shall be used to document OJT Type A for safety specialties only.

b. For skills certifications referenced in Appendix C, supervisors shall use only MSFC Forms 4083 and 4293 and submit to the SR&QA Policy & Assessment Department for final approval, with the exception of Electrostatic Discharge (ESD) certifications. Use only the MSFC Form 4083 for ESD certifications and submit to the SR&QA Policy & Assessment Department for final approval. MSFC Form 4293 titled "Eye Exam Certification" is not required for ESD.

6.1.3.6 Reassign employees to duties that do not require certification when individuals fail to meet certification requirements. Notify the S&MA Certification Administrator (CA) when an employee no longer requires certification. Employees required to operate machinery for safety certification, who fail medical exams, shall be reassigned until medical exam has been passed.

6.1.4 Proficiency examiners shall present Train-the-Trainer documentation or equivalent documentation to the Industrial Safety Department for approval.

6.1.4.1 The safety specialty proficiency examiner shall present credentials, to include certificates of training and prior work experience to the Industrial Safety Department for evaluation, and shall also have Train-the-Trainer experience.

6.4.1.2 The skills proficiency examiner also serves as the instructor.

6.1.5 Certified personnel, safety representatives, and supervisors who have been granted approval by the CA shall access CERTRAK, select View Employee's Certifications, and print a certification record. This printout shall be maintained on employee's person when performing the task/skill that requires certification, maintained in the supervisor's and foreman's office, or in a location nearby the operation for which the certification is necessary. Personnel certified in Electrostatic Discharge (ESD) awareness for electrical devices (excludes pyrotechnics) shall be exempt from this requirement.

## 6.2 Certification Process.

6.2.1 Safety Certification. Employees performing tasks listed in Appendix A shall be certified prior to performing potentially hazardous operations. Organizations shall identify potentially hazardous tasks not listed in Appendix A for certification requirements evaluation. S&MA shall approve special safety training courses and certification programs; training courses to be substituted for those listed in Appendix A; and contractor safety training courses. Supervisors shall nominate for safety certification only those employees whose knowledge, skill, and experience ensure a level of proficiency that will result in safe performance of potentially hazardous operations encompassed by their job descriptions. Employees shall comply with Appendix A certification requirements. Supervisors shall ensure that employees receive an

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 13 of 28

annual medical exam for certifications that require an exam. Only those employees who pass the medical exam shall perform duties requiring certification that includes a medical exam. Employees who fail the exam shall be reassigned to other duties until the medical exam has been passed.

6.2.2 Skills Certification. Skills certification shall be required for, but not limited to, the skills listed in Appendix C. Certification for all skills/tasks shall meet the requirements of the process/workmanship specification and/or the certification instruction. In the absence of established training, experience requirements, or certification intervals, the proficiency examiner or technical advisor shall recommend to the certifying officer appropriate requirements. Other process/ workmanship skills that require certification shall be identified to the certifying officer.

6.3 Contractor Requirements. The contractor shall evaluate potentially hazardous operations within the scope of their contract to determine which safety specialties, and skilled operations are required. They shall determine the certification training required, and define other safety specialties/skilled operations that require training and certification (in addition to those identified herein) within that contractor's Safety and Health Plan and/or Personnel Certification Plan which shall be approved by S&MA. Contractors shall have safety certification specialties indicated by an asterisk in Appendix A.

6.3.1 The contractor shall provide S&MA with the individual selected as their certifying officer for safety specialties and skills certifications. The contractor shall designate a safety specialties and skills proficiency examiner and submit the credentials of that individual to S&MA for review and approval. Approval shall be noted in the CERTRAK "List of Certifying Officers" and "List of Proficiency Examiners."

6.3.2 The contractor shall ensure that affected employees have training assessments and certifications. Contractors shall obtain MSFC certifications for employees who were previously safety-certified by another contractor under an MSFC-approved plan 1 year from the date of new contract award.

6.3.3 The contractor shall maintain records of OJT required for the position for as long as the employee fills that position or as long as required by OSHA, as appropriate. S&MA shall be notified when an employee no longer requires a safety or skill certification issued by that office (e.g., retires or transfers to another job). Contractors shall maintain safety training and certification records for their employees in accordance with the requirements of their approved certification plan(s) and this MWI. Contractors shall apply for MSFC safety certification (via MSFC Form 4083) for the following specialties: PCH handlers; operators of MSFC-owned lifting equipment (e.g., aerial lifts, cranes, forklifts, KAMAG Transporters, etc.); onsite propellant/explosive handlers; and, other specialties as identified.

6.3.4 Certifications for the operation of MSFC lifting equipment shall be issued for the specific equipment item on which the employee demonstrated proficiency. The equipment shall be identified by MSFC preventive maintenance number or other MSFC identification number and requires identification on MSFC Form 4083. Where MSFC owns two or more equipment items

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 14 of 28

identical in manufacturer, model number, and all functional parameters, a single proficiency examination shall qualify the employee to operate all identical equipment items.

6.3.5 Employee demonstration of proficiency (proficiency tests), where required in Appendix A, shall only be performed after required classroom training (to include written tests where required), physical examination with physicians signature on MSFC Form 4083-2, and completion of either Type A or B OJT. MSFC Forms 4083 and 4083-2 shall be fully completed and checked by the Lifting Equipment Examiner prior to the employee performing a proficiency test. When classroom training is not available, the Industrial Safety Department may extend a certification until training is offered.

## 7. NOTES

None

## 8. SAFETY PRECAUTIONS AND WARNING NOTES

None

## 9. RECORDS

The following records shall be maintained in accordance with NRRS 3/33/G/2 [3400] by the S&MA CA for the length of employment, then destroyed when no longer needed.

9.1 Evidence of personnel proficiency (e.g., MSFC Form 4333 (used for safety specialties only), exam reports, letters from training organizations, etc.) .

9.2 CERTRAK records.

9.3 Completed MSFC Forms 4083, 4083-1, 4083-2, and 4293 . MSFC Form 4083-2 shall be maintained by Occupational Medicine and Environmental Health Services.

9.4 List of certified personnel.

9.5 List of proficiency examiners and certifying officers.

9.6 NDT logbook, when required to establish experience history (employee).

9.7 Equivalent work experience. Refer to paragraph D.2.3.

9.8 Lockout/Tagout procedure review records. Refer to MWI 8715.2, Lockout/Tagout Program, Section 9. Records.

## 10. PERSONNEL TRAINING AND CERTIFICATION

None

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 15 of 28

## 11. FLOW DIAGRAM

None

## 12. CANCELLATION

MWI 3410.1E dated November 8, 2004

*Original signed by  
Robin N. Henderson for*

David A. King  
Director

APPENDIX A. Safety Certification Requirements

APPENDIX B. Federal and State Training

APPENDIX C. Skill That Require Certifications

APPENDIX D. Nondestructive Testing/Nondestructive Evaluations (NDT/NDE)

APPENDIX E. Electrical Process Skills (EPS)

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 16 of 28

## **APPENDIX A. SAFETY CERTIFICATION REQUIREMENTS**

A.1 Safety Certification Requirements are identified in Table A-1 below.

<b>TABLE A-1. SAFETY CERTIFICATION REQUIREMENTS</b>			
<b>CERTIFICATION SPECIALTY [REFERENCE]</b>	<b>REQUIREMENTS</b>	<b>CERT. PERIOD</b>	<b>RECERT. REQUIREMENTSS</b>
* Aerial Lift Operator <ul style="list-style-type: none"> <li>• Boom-Supported</li> <li>• Bucket Truck</li> <li>• Vertical</li> </ul> [CFR 1910.67; 1926.453]	<ul style="list-style-type: none"> <li>• Aerial Work Platform Training (NSTC 030), Manufacturer's Course, or equivalent (SHE 509)</li> <li>• Fall Protection (NSTC 311) or equivalent (SHE 113)</li> <li>• Type B OJT</li> <li>• Written &amp; Proficiency Tests</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Proficiency Test</li> <li>• Physical</li> </ul>
Confined Space Entry [CFR 1910.146 and MPR 1840.1]	<ul style="list-style-type: none"> <li>• Confined Space Entry Training (AS60)</li> <li>• Written Test</li> <li>• Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• Refresher Training (AS60)</li> <li>• Physical</li> </ul>
Cryogen Handler	<ul style="list-style-type: none"> <li>• Cryogenic Safety (NSTC 313) or equivalent</li> <li>• Physical</li> </ul>	4 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> </ul>
* Derrick Crane Operator [ NASA-STD-8719.9]	<ul style="list-style-type: none"> <li>• Derrick Crane Training Course (NSTC 208) or equivalent (SHE 518)</li> <li>• PCH Training for Critical Lifts (AS42) (SHE 500)</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Physical</li> <li>• Written &amp; Proficiency Examinations</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>
* Forklift Operator: <ul style="list-style-type: none"> <li>• Class 1: Electric Motor, Sit-Down Rider, Counter-Balanced Trucks (Solid and Pneumatic Tires)</li> <li>• Class 2: Electric Motor Narrow Aisle Trucks (Solid Tires)</li> <li>• Class 3: Electric Motor Hand Trucks or Hand/Rider Trucks (Solid Tires)</li> <li>• Class 4: Internal Combustion Engine Trucks (Solid Tires)</li> <li>• Class 5: Internal Combustion Engine Trucks (Pneumatic Tires)</li> <li>• Class 6: Electric and Internal Combustion Engine Tractors (Solid and Pneumatic Tires)</li> <li>• Class 7: Rough Terrain Forklift Trucks (Extended Boom)Trucks</li> </ul>	<ul style="list-style-type: none"> <li>• Forklift Safety (NSTC 209) or equivalent</li> <li>• Shall be 18 years old to operate</li> <li>• PCH Training for PCH Cert. (AS42) (SHE 500)</li> <li>• Written &amp; Proficiency Tests</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Shall be 18 years old</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>
	<ul style="list-style-type: none"> <li>• Current certification as a Forklift Operator</li> <li>• Study of Manufacturer's Operator's Manual</li> <li>• Hands-on orientation from certified operator</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Review Manufacturer's Operator's Manual</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 17 of 28

**TABLE A-1. SAFETY CERTIFICATION REQUIREMENTS**

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERT. PERIOD	RECERT. REQUIREMENTSS
* Portal Crane Operator [NSS 1740.9]	<ul style="list-style-type: none"> <li>• Gantry Crane Training Course (NSTC 205) or equivalent (SHE 517)</li> <li>• PCH Training for PCH Cert. (AS42) (SHE 500)</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Physical</li> <li>• Written &amp; Proficiency Examinations</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>
Hazardous Waste Operations and Emergency Response (HAZWOPER) Technician	<ul style="list-style-type: none"> <li>• Hazardous Waste Operations and Emergency Response (HAZWOPER) (40 Hours) (SHE 308)</li> <li>• Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• Hazardous Waste Operations and Emergency Response Management Refresher (8 Hours) (SHE 303)</li> <li>• Physical</li> </ul>
Heavy Equipment Operator (earth- moving equipment)	<ul style="list-style-type: none"> <li>• Valid state-issued CDL, Class A or B</li> <li>• Valid DOT Medical Card</li> <li>• Physical</li> <li>• Type B OJT</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Valid state-issued CDL</li> <li>• Valid DOT Medical Card</li> </ul>
Mobile Sweeper Operator			
High Pressure Systems (> 150 psig) (liquid/vapor/gas)	<ul style="list-style-type: none"> <li>• High Pressure System Safety Class (NSTC 315) or equivalent (SHE 121)</li> <li>• Physical</li> </ul>	4 Years	<ul style="list-style-type: none"> <li>• Refresher training</li> <li>• Physical</li> </ul>
* Hydraset Operator [NSS 1740.9]	<ul style="list-style-type: none"> <li>• Manufacturer's Course or equivalent</li> <li>• PCH Training for PCH Cert (AS42) (SHE 500)</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Written &amp; Proficiency Tests</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Proficiency Test</li> <li>• Physical</li> </ul>
Hydrogen Handlers/Users	<ul style="list-style-type: none"> <li>• Cryogenic Safety (NSTC 313)</li> <li>• Safety in Hydrogen System Operations (NSTC 054)</li> <li>• HazCom</li> <li>• Physical</li> <li>• Type A OJT</li> </ul>	2 Years	<ul style="list-style-type: none"> <li>• Refresher training</li> <li>• Physical</li> </ul>
Inert/Asphyxiate Gases and Liquids	<ul style="list-style-type: none"> <li>• Cryogenic Safety (NSTC 313)</li> <li>• Liquid Nitrogen Handlers Course (NSTC 314) or equivalent (SHE 123)</li> <li>• HazCom</li> <li>• Physical</li> <li>• Type A OJT</li> </ul>	2 Years	<ul style="list-style-type: none"> <li>• Refresher training</li> <li>• Physical</li> </ul>
* KAMAG Operator/Flagman	<ul style="list-style-type: none"> <li>• KAMAG Operation Training Course (SHE 511)Valid state-issued CDL, Class A</li> <li>• Valid DOT Medical Card</li> <li>• Type A OJT for PCH</li> <li>• Type B OJT otherwise</li> <li>• Proficiency Test</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Proficiency Test</li> <li>• Physical</li> <li>• Valid state-issued CDL, Class A</li> <li>• Valid DOT Medical Card</li> </ul>
Laser Maintenance Personnel MPD 1860.1 [ANSI Z136.1]	<ul style="list-style-type: none"> <li>• Laser Safety Course (AS60) or equivalent</li> <li>• Lockout/Tagout (NSTC 814)</li> <li>• Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> </ul>

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 18 of 28

**TABLE A-1. SAFETY CERTIFICATION REQUIREMENTS**

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERT. PERIOD	RECERT. REQUIREMENTSS
Laser Operator (> Class 3b or 4) [MPD 1860.1] ANSI Z136.1	<ul style="list-style-type: none"> <li>• Laser Safety Course (AS60) or equivalent</li> <li>• Physical</li> <li>• Initial and Exit Ophthalmology Exam</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> </ul>
* Lifting Equipment Examiner (Proficiency Test Examiner)  Forklift Mobile Crane Overhead Cranes /Aerial Lifts Rigging KAMAG, Portal Crane, Derrick Crane Hydraset	<ul style="list-style-type: none"> <li>• Associated Train-the-Trainer Certified Course or equivalent when approved by MSFC Industrial Safety Dept</li> <li>• Physical</li> <li>• Supervisor Statement verifying experience/OJT submitted to S&amp;MA for review/approval</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Associated Train-the-Trainer Recertification Course, or equivalent when approved by MSFC Industrial Safety Dept</li> <li>• Physical</li> </ul>
Lockout/Tagout, Authorized Employee [CFR 1910.147]	<ul style="list-style-type: none"> <li>• Lockout/Tagout (NSTC 814) or equivalent (SHE 128)</li> <li>• Written Test</li> <li>• Physical</li> </ul>	2 Years	See A.2
* Mobile Crane Operator [NSS 1740.9]	<ul style="list-style-type: none"> <li>• Mobile Crane Operator Course (NSTC 208) or equivalent (SHE 516)</li> <li>• PCH Training for PCH Cert (AS42) (SHE 500)</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Written &amp; Proficiency Tests</li> <li>• Physical</li> <li>• CDL required for travel on roadway</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> <li>• Proficiency test</li> <li>• Valid CDL and DOT medical card</li> </ul>
* Overhead Crane/Hoist Operator [NASA STD 8719.9]	<ul style="list-style-type: none"> <li>• Overhead Cranes &amp; Materials Handling (NSTC 205) or equivalent (SHE 507)</li> <li>• PCH Training for PCH Cert (AS42) (SHE 500)</li> <li>• Type A OJT for PCH/Critical</li> <li>• Type B OJT otherwise</li> <li>• Written &amp; Proficiency Tests</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> <li>• Proficiency Test</li> </ul>
Oxygen System Handlers	<ul style="list-style-type: none"> <li>• Cryogenic Safety (NSTC 313)</li> <li>• Oxygen Systems: Operation and Maintenance (NSTC 053) or equivalent (SHE 053)</li> <li>• HazCom</li> <li>• Physical</li> <li>• Type A OJT</li> </ul>	2 Years	<ul style="list-style-type: none"> <li>• Refresher training</li> <li>• Physical</li> </ul>
Oxygen System User	<ul style="list-style-type: none"> <li>• Fire Hazards in Oxygen Systems (NSTC 052) or equivalent (SHE 133)</li> <li>• HazCom</li> <li>• Physical</li> <li>• Type B OJT</li> </ul>	2 Years	<ul style="list-style-type: none"> <li>• Refresher training</li> <li>• Physical</li> </ul>
* PCH - Manual Move [MWI 6410.1]	<ul style="list-style-type: none"> <li>• PCH Training (AS42) (SHE 500)</li> <li>• Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>• Refresher Training</li> <li>• Physical</li> </ul>

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 19 of 28

**TABLE A-1. SAFETY CERTIFICATION REQUIREMENTS**

CERTIFICATION SPECIALTY [REFERENCE]	REQUIREMENTS	CERT. PERIOD	RECERT. REQUIREMENTSS
PCH-S&MA Monitor	<ul style="list-style-type: none"> <li>PCH Training (AS42) S&amp;MA Critical Lift Course</li> <li>Physical</li> <li>Type B OJT</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>S&amp;MA Critical Lift Course</li> <li>Physical</li> </ul>
* Propellant & Explosive Handler[NSS 1740.12]	<ul style="list-style-type: none"> <li>Explosive Handler's Course (NSTC 009) or equivalent (SHE 111)</li> <li>Type A OJT</li> <li>Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>Refresher Course</li> <li>Physical</li> </ul>
* Propellant and Explosive User [NSS 1740.12]	<ul style="list-style-type: none"> <li>Explosive Handler's Course (NSTC 082) or equivalent (SHE 111)</li> <li>Explosives Safety Program Management (NSTC 010)Type B OJT</li> <li>Physical</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>Refresher Course (NSTC 009)</li> <li>Physical</li> </ul>
Radiation [MPD 1860.2]	<ul style="list-style-type: none"> <li>Radiation Safety training (AS60)</li> <li>Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>Refresher Course</li> <li>Physical</li> </ul>
Respirators (Non-SCBA) [MPD 1840.3]	<ul style="list-style-type: none"> <li>Respirator Training (AS60)</li> <li>Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>Refresher Course</li> <li>Physical</li> </ul>
Rigger [NSS 1740.9]	<ul style="list-style-type: none"> <li>Lift Riggers Course</li> <li>Written &amp; Proficiency Tests</li> <li>Type A OJT for PCH/Critical</li> <li>Type B OJT otherwise</li> <li>Physical</li> <li>PCH Training for PCH Cert. (AS42) (SHE 500)</li> </ul>	3 Years	<ul style="list-style-type: none"> <li>Refresher Course</li> <li>Physical</li> <li>Proficiency Test</li> </ul>
Self-Contained Breathing Apparatus (SCBA) [MPD 1840.3]	<ul style="list-style-type: none"> <li>SCBA Training (AS60)</li> <li>Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>Refresher Course</li> <li>Physical</li> </ul>

A.2 Lockout/Tagout personnel certification requires documentation every two years demonstrating a review of the Lockout/Tagout procedures during the previous certification period. This documentation shall consist of the applicant's name attached to a completed MSFC Form 4287. A MSFC Form 4083-2 shall be required every 4 years.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 20 of 28

## **APPENDIX B. STATE AND FEDERAL TRAINING**

B.1 State and Federal Training Requirements are identified in Table B-1 below.

**TABLE B-1. STATE AND FEDERAL TRAINING REQUIREMENTS**

<b>CERTIFICATION SPECIALTY [REFERENCE]</b>	<b>REQUIREMENTS</b>	<b>CERT. PERIOD</b>	<b>RECERT. REQUIREMENTSS</b>
Asbestos Abatement for asbestos/heavy metal: <ul style="list-style-type: none"> <li>• Supervisor</li> <li>• Worker</li> </ul> [Alabama Asbestos Contractor Accreditation Act (89-517); 1910.1001; 1926.1101; 40 CFR]	<ul style="list-style-type: none"> <li>• State Accredited Training [State Registration, Safe State (1-800-452-5928)]</li> <li>• Supervisor State-Accredited Course</li> <li>• Worker State-Accredited Course</li> <li>• Physical</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• State-Accredited Refresher Course</li> <li>• Physical</li> </ul>
Asbestos Exposure Awareness (Class IV) [1910.1001; 1926.1101; 40 CFR]	<ul style="list-style-type: none"> <li>• State Accredited Training [State Registration, Safe State (1-800-452-5928)]</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• State-Accredited Refresher Course</li> </ul>
Asbestos Operations & Maintenance (Class III) [1910.1001; 1926.1101; 40 CFR]	<ul style="list-style-type: none"> <li>• State Accredited Training [State Registration, Safe State (1-800-452-5928)]</li> </ul>	1 Year	<ul style="list-style-type: none"> <li>• State-Accredited Refresher Course</li> </ul>
Commercial Motor Vehicle Operator <ul style="list-style-type: none"> <li>• Class A &gt;26,001 lbs</li> <li>• Class B &lt;26,000 lbs</li> <li>• Class C</li> <li>• Hazardous Material endorsement</li> <li>• Tanker endorsement</li> <li>• Hazardous Material/Tanker endorsement</li> <li>• Air Brakes restriction</li> </ul>	<ul style="list-style-type: none"> <li>• Valid Department of Transportation (DOT) Medical Card (requires physical examination; valid for 2 years)</li> <li>• Valid state-issued Commercial Driver License (CDL)</li> </ul>	4 Years	<ul style="list-style-type: none"> <li>• Copy of renewed state-issued CDL</li> <li>• Copy of renewed DOT Medical Card</li> </ul>
Flight Deck Crew	<ul style="list-style-type: none"> <li>• Appropriate FAA license and certification</li> <li>• Physical</li> </ul>	Determined by FAA	<ul style="list-style-type: none"> <li>• FAA requirements</li> <li>• Physical</li> </ul>

B.2 Training specialties in Table B-1 do not require a MSFC Form 4083 or MSFC Form 4083-2.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 21 of 28

APPENDIX C. <u>SKILLS THAT REQUIRE CERTIFICATION</u>	
SKILL/TASK	REQUIREMENTS
Penetrant Testing	Appendix D
Magnetic Particle Testing	Appendix D
Eddy Current Testing	Appendix D
Ultrasonic Testing	Appendix D
Radiographic Testing	Appendix D
Soldering including SMT	Appendix E
Staking and Conformal Coating	Appendix E
Cabling, Harnessing, and Wiring	Appendix E
Electrostatic Discharge Control	Appendix E
Crimping	Appendix E

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 22 of 28

## **APPENDIX D. NONDESTRUCTIVE TESTING/NONDESTRUCTIVE EVALUATIONS (NDT/NDE)**

### **D.1 PURPOSE**

This Appendix establishes the minimum requirements for the qualification and certification of MSFC personnel who perform or witness Nondestructive Testing/Nondestructive Evaluation (NDT/NDE) for flight or flight-associated hardware using the following methods:

- a. Liquid Penetrant Testing (PT)
- b. Magnetic Particle Testing (MT)
- c. Ultrasonic Testing (UT)
- d. Radiographic Testing (RT)
- e. Eddy Current Testing (ET)

D.1.1 Exceptions. This Appendix shall not apply to personnel who perform NDE for research only or who perform radiographic inspection of electrical, electronic, or electro-mechanical parts.

D.1.2 Other NDT Methods. This Appendix shall be used to certify individuals to other NDT methods. If certification is required, this procedure shall be amended. In all cases, the personnel requirements of the process specification for which certification is being sought shall be met. Certification requirements for other NDT methods shall be submitted to the certifying officer for approval.

D.1.3 Levels of Certification. The following Nondestructive Evaluation (NDE) certification levels shall be established for each NDT method:

D.1.3.1 NDE Level I

D.1.3.2 NDE Level II

D.1.3.3 NDE Level III

D.1.4 Levels of Qualification. There shall be four levels of personnel qualification:

D.1.4.1 Trainee

D.1.4.2 Level I

D.1.4.3 Level II

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 23 of 28

#### D.1.4.4 Level III

## D.2 TRAINING AND EXPERIENCE REQUIREMENTS

Candidates for certification as Level I or Level II shall complete sufficient organized training to become familiar with the principles and practices of the applicable test method and techniques. All NDT training shall comply with the requirements of NAS 410, NAS Certification and Qualification of Nondestructive Test Personnel, except as noted herein. The training shall be conducted in accordance with a course outline developed using the training course outlines of SNT-TC-1A as a guide. The training shall include requirements from the specifications and procedures used to perform the method. The training shall cover basic principles, products, equipment, operating procedures and techniques, and the applicable specifications, codes, and instructions used by MSFC. After May 1998, all trainees shall maintain a logbook documenting hours of on-the-job experience for each method. The logbook shall reference work authorizing documents, test reports, and other supporting documents, as applicable.

D.2.1 Exams. An individual shall pass a final exam in order to receive credit for a block of training hours.

D.2.2 Minimum Required Training and Experience Hours. The minimum training and experience hours for Levels I and II shall be given in Table D-1 for a variety of NDT methods.

a. For Level II certification, the experience shall consist of the time at Level I or equivalent. If an individual is being initially certified at Level II without prior Level I experience, then the experience required shall be the sum of the experience required for Levels I and II and the training required shall be the sum of the training required for Levels I and II.

b. Listed training hours shall be adjusted by the certifying officer depending on the candidate's formal education level based on the supervisor's recommendations.

D.2.2.2 The minimum training and experience hours for those methods not covered by Table D-1 shall be as determined by the Level III and agreed upon by the certifying officer.

D.2.2.3 There shall be no additional training requirements to transition from Level II to Level III, nor can an individual have sufficient training to allow certification to Level III without prior certification as a Level II or performance equivalent to a Level II.

a. One-year experience at Level II or equivalent work experience shall be required for candidates that possess a technical bachelor's degree to qualify for Level III.

b. Two-years experience shall be required if the candidate possesses a technical associate degree.

c. Four-years experience shall be required if the candidate does not hold a degree.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 24 of 28

d. Equivalency of work experience shall be determined and documented by the cognizant Level III personnel and provided to the certifying officer.

e. Experience in multiple methods may be accumulated simultaneously.

**TABLE D-1. TRAINING AND EXPERIENCE REQUIREMENTS**

Examination Method	Level	Initial Training (Hours)		Experience Level (Months)
		High School Graduate or Equivalent	Completion with a Passing Grade of at Least 2 Years of Study in Science or Engineering at a College Level	
ET	I	40	24	3
	II	40	40	9
MT	I	12	8	1
	II	8	4	3
PT	I	4	4	1
	II	8	4	2
RT	I	39	29	3
	II	40	35	9
UT	I	40	30	3
	II	40	40	9

D.2.3 Previous Training/Experience. Training or experience obtained from a prior employer shall be documented before accepted by MSFC.

D.2.4 Equivalent Experience. For personnel certified under other qualification/certification programs, the equivalency of their previous experience to the requirements of Table D-1 shall be determined and documented.

D.2.5 Experience Required for Witnessing. The experience requirements for certification to witness NDT shall require completion of the initial training hours and 1/4 of the experience level values in Table D-1 per the applicable certification level.

D.2.6 Examinations. Verification of technical qualifications of personnel shall consist of a general, specific, and a practical examination. Development of an NDT procedure may be substituted for the Level III practical exam if the individual does not perform NDT for acceptance of flight hardware. SNT-TC-1A may be used as a guide in developing examinations.

D.2.6.1 Physical. Near vision and color perception tests shall be administered prior to certification or recertification. These tests shall be documented on MSFC Form 4293. The tests shall be per the following requirements:

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Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 25 of 28

a. Near Vision. When tested using a Jaeger #1 test chart or equivalent at not less than 12 inches, vision in one eye shall be 20/20, either natural or corrected.

b. Color Perception. Distinguish and differentiate between the colors used in the method for which certification is sought.

### **D.3 CERTIFICATION**

D.3.1 Certification. Personnel who have demonstrated that they possess the appropriate qualifications shall be certified by the MSFC certifying officer in accordance with this instruction. A minimum composite score of 80 percent shall be required for certification. The composite score shall be the simple average of the general, specific, and practical exams.

D.3.2 Revocation of Certification. Certification shall be revoked when the individual does not perform NDT in the method certified for at least 12 months or the individual's performance is found to be deficient. Prior to revocation for deficient performance, the certifying officer shall consult with the employee's supervisor and if the two agree, the employee shall be allowed to re-demonstrate proficiency to prevent the certification from being revoked.

D.3.3 Recertification. Levels I and II personnel shall be recertified at intervals not to exceed 5 years. Level III personnel and NDT/NDE proficiency examiners/instructors shall be recertified at intervals not to exceed 5 years. When necessary, the MSFC certifying officer shall extend or limit the certification period based on recommendations of the individual's supervisor. Extensions shall not exceed 6 months. The physical and practical examinations, equivalent to those required for initial certification, shall be given prior to recertification. Level I and Level II personnel shall be reexamined and recertified per the requirements of NAS 410. Level III personnel shall be reexamined and recertified every 5 years using ASNT criteria by an ASNT authorized examination center, or per the requirements of NAS 410. Alternately and with prior approval of the certifying officer, the practical exam for Levels I and II shall be replaced by a demonstration of proficiency with the results documented or by a documented audit of actual work performed.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 26 of 28

## **APPENDIX E. ELECTRICAL PROCESS SKILLS (EPS)**

### **E.1 PURPOSE**

This Appendix establishes the minimum requirements for the certification and/or qualification of MSFC personnel who fabricate or inspect flight or flight-associated hardware using electrical process skills (EPS) per the documents referenced herein.

E.1.1 Exceptions. Personnel developing technology and performing research shall not be required to be certified.

E.1.2 EPS Categories.

E.1.2.1 Personnel performing electrical process skills (EPS) shall be certified as either operators or inspectors to the applicable MSFC document in Table E-1. Operators shall be authorized to perform work on flight and flight-associated hardware, and inspectors shall be authorized to accept flight and flight-associated hardware.

E.1.2.2 Personnel evaluating EPS for certification shall be classified as technical advisors. Technical advisors shall complete the same training requirements as operators/inspectors or have equivalent experience. Technical advisors do not need to be certified; however, they shall be recognized as experts in their field. Technical advisors shall be recommended by their supervisors for approval by the certifying officer. Beginning with technical advisors appointed after July 1999, supervisors shall submit to the certifying officer their documented credentials.

### **E.2 TRAINING**

E.2.1 Training Organization. Training shall be obtained from a school approved by a technical advisor and the MSFC Certifying Officer. Other agencies, which may be used for training, shall be subject to review and approval by the technical advisor and the MSFC Certifying Officer.

E.2.2 Lesson Plans. Lesson plans shall be developed for each training course required. The plans shall include topics to be addressed, practical test specifics, and examination examples. Training contractor lesson plans shall be reviewed and approved by the technical advisor.

E.2.3 Instructor Qualifications. Instructors shall be recognized experts in their field. Instructors shall be evaluated to requirements of the EPS documents specified herein, as determined by the MSFC certifying officer and technical advisor.

E.2.4 Training Requirements for Initial Certification.

E.2.4.1 Personnel who perform operator or inspector tasks for any of the electrical processes shall meet the initial certification/qualification requirements of Table E-1. Documented previous training and experience shall be accepted for certification at the discretion of the technical advisor and MSFC certifying officer. Certification shall be required for all EPSs. Also, operator

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 27 of 28

certification for surface mount technology (MSFC-STD-2904) shall require additional training on the exact machine used for production at the supervisor's discretion.

E.2.4.2 Examinations. Written and practical examinations shall be administered and graded by the instructor or designated representative. Copies of the examination shall be retained on file.

a. Vision Examination. Vision and color perception tests shall be administered per the applicable process document by the MSFC Medical Center personnel prior to certification. The vision tests shall be administered prior to certification/recertification and shall be documented on MSFC Form 4293.

b. Written Examination. For initial certification, each candidate shall score at least 80 percent on a written exam typically consisting of at least 25 questions.

c. Practical Examination. The candidate shall pass a practical exam which is representative of the work to be performed and fully demonstrates proficiency in the skill (excluding ESD). For inspectors, the practical exam shall include fabrication of samples and shall include an inspection test. For operators, the practical exam may include an inspection test and shall include fabrication of samples. As an option to the practical exam, proficiency demonstration can also be accomplished by a supervisor and MSFC certifying officer audit of actual work performed provided the audit results are documented and included in the employee's personnel certification file.

### E.3 CERTIFICATION

E.3.1 Candidate civil service personnel who meet the above criteria shall be certified by the MSFC certifying officer upon the recommendations of their supervisors. Contractor personnel shall be certified by the individual designated by their company.

**TABLE E-1. EPS TRAINING REQUIREMENTS (hours)**

TASK	INITIAL CERT	RECERT	REQUIREMENT
Soldering (thru-hole and Surface Mount Technology)	40	16	MSFC-STD-2903/2904
Cabling	28	8	MSFC-STD-2905
Crimping	12	4	MSFC-STD-2905
Conformal coating/staking	16	8	MSFC-STD-2906
ESD control	2	See E3.2.b	MSFC-RQMT-2918

E.3.2 Recertification. Training for recertification shall be required at the discretion of the individual's supervisor. Recertification shall include a demonstration of proficiency in accordance with E3.2.1.

Marshall Work Instruction QD01		
Personnel Certification Program	MWI 3410.1	Revision: F
	Date: November 2, 2005	Page 28 of 28

- a. Recertification of electrical process skills (EPS) operators and inspectors shall be required every 3 years except for ESD.
- b. ESD recertification shall be required at the discretion of the individual's supervisor based on personnel performance, the use of new technology, or when requirement violations are observed.
- c. When necessary, the MSFC certifying officer shall extend or limit the certification period based on recommendations of the individual's supervisor. Extensions may not exceed 6 months.
- d. EPS proficiency examiners/instructors shall be recertified every 2 years except for ESD.

E.3.2.1 Demonstration of proficiency shall be required for recertification. This may be achieved by fabrication/inspection of samples, completion of a refresher training course approved by the technical advisor, or by an audit of an individual's actual work performed by the MSFC certifying officer and their supervisor. Recertification may also include a written examination.

E.3.2.2 Each recertification method shall require documentation to substantiate compliance. The method chosen for recertification shall be the responsibility of the individual's supervisor.

E.3.3 Loss of Certification. Certification shall be revoked under the following conditions:

E.3.3.1 Evidence of deficient performance.

E.3.3.2 Interruption of a work period for more than 6 months.

E.3.3.3 New techniques have been developed which require different skills.

E.3.3.4 Employment has been terminated.

E.3.3.5 Job function has changed and new function does not require EPS.